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REMARKS:

Applicants note that this response uses the new revised format for amendments set forth at <http://www.uspto.gov/web/officcs/pac/dapp/opla/preognotice/officeflyer.pdf>.

Status

After this response, claims 3 to 5, 7, 10 to 15, 17, 20 to 25, 27, and 30 to 33 are pending. Claims 3, 5, 7, 10, 13, 15, 17, 20, 23, 25, 27, 30 and 33 have been amended, and claims 6, 16 and 26 have been cancelled. Claims 3, 5, 7, 13, 15, 17, 23, 25, 27 and 33 are the independent claims. Reconsideration and further examination are respectfully requested.

Claim Objections

Claims 10, 20 and 30 were objected to for an alleged informality, namely use of the term "root node." Applicants note that this term found antecedence in base claims 7, 17 and 27, each of which recited a "root node." However, in order to forestall a continued objection, Applicants have amended the term "root node" in claims 7, 10, 17, 20, 27 and 30 to read "root inode." No change whatsoever in the scopes of the claims is intended by these amendments.

Claim 33 was also objected to for using the language "comprising the steps of" for a system. Applicants have corrected this informality.

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Section 112 Rejection

Claims 5, 6, 15, 16, 25 and 26 were rejected under 35 U.S.C. § 112, ¶ 2, for alleged indefiniteness because they recited "queuing" and "requeuing" without reciting "dequeuing." Applicants have deleted the "requeuing" step from the claims. Accordingly, withdrawal of the rejection is respectfully requested.

Allowable Subject Matter

The Office Action indicated that claims 6, 16 and 26 recited allowable subject matter and would be allowable if rewriting in independent form including all of the limitations of their base claims, which were rejected under § 112, ¶ 2. Applicants have amended base claims 5, 15 and 25 to include the limitations of claims 6, 16 and 26, which have been cancelled. As noted above, Applicants have also addressed the § 112, ¶ 2, rejection of the base claims. Accordingly, allowance of claims 5, 15 and 25 is respectfully requested.

Section 103 Rejections

Claims 3, 4, 13, 14, 23 and 34: These claims were rejected under 35 U.S.C. § 103(a) over "The Design of the UNIX® Operating System" (Bach) in view of "The Episode File System" (Chutani) and U.S. Patent No. 5,043,871 (Nishigaki).

Amended independent claim 3 is reproduced below for the Examiner's convenience:

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3. A method for recording a plurality of data about a plurality of blocks of data stored in a storage system, comprising the step of maintaining multiple usage bits for each of said plurality of blocks; wherein one bit of said multiple usage bits for each of said plurality of blocks indicates a block's membership in an active file system and plural bits of said multiple usage bits for each of said plurality of blocks indicate membership in plural read-only copies of a file system; and wherein said multiple usage bits for each of said plurality of blocks are maintained in said active file system.

The applied art, alone or in combination, is not seen to disclose or to suggest the foregoing features of claim 3, at least with respect to multiple usage bits that indicate a block's membership in an active file system and in plural read-only copies of a file system, with the multiple usage bits maintained in that active file system.

In this regard, the Office Action indicated that neither Bach nor Chutani explicitly taught a method of maintaining data wherein the storage system is capable of storing multiple usage bits for multiple read-only copies of a file system. Nishigaki was cited as remedying this deficiency of Bach and Chutani.

First, Applicants note the Nishigaki deals with a database, not an active file system. Apparently, Nishigaki's teachings with respect to the database have been analogized to a file system, and Nishigaki's backup version tables and slot maps have been analogized to the claimed multiple usage bits. However, Applicants understand Nishigaki to teach that the tables and slot maps are stored apart from database storage medium 50 in a volatile storage medium 100. See Nishigaki, col. 5, lines 31 to 38. Thus, even if Nishigaki's database is analogized to claim 3's active file system, Nishigaki is not seen by Applicants to teach storing usage bits for a file system and copies of file systems in that file system.

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The other applied references are not believed by Applicants to offer anything that remedies this deficiency of Nishigak. In particular, in the absence of teachings regarding use of such multiple storage bits for multiple read-only copies of a file system, Applicants do not see the references as being capable of teaching storage of such multiple usage bits in the active file system.

For at least the foregoing reasons, reconsideration and withdrawal are respectfully requested of the § 103(a) rejection of claim 3 and its dependent claim 4, as is allowance of those claims.

Claims 13 and 14 recite memories storing instructions that implement the methods of claims 3 and 4. Likewise, claims 23 and 24 recite systems that implement the methods of claims 3 and 4. Accordingly, reconsideration and withdrawal are respectfully requested of the § 103(a) rejection of those claims, as is their allowance.

Claims 5, 15 and 25: These claims were rejected under § 103(a) over Bach in view of U.S. Patent No. 5,008,786 (Thattc). This rejection has been rendered moot by the incorporation of the allowable subject matter of claims 6, 16 and 26 into the claims.

Claims 7, 10 to 12, 17, 20 to 22, 27, and 30 to 33: Claims 7, 10, 17, 20, 27 and 30 were rejected under § 103(a) over Bach in view of Chutani and Thatte. Claims 11, 21 and 31 were rejected under § 103(a) over Bach in view of Chutani, Thatte, and U.S. Patent No. 5,701,480 (Raz). Claims 12, 22 and 32 were rejected under § 103(a) over Bach in view of Chutani, Thatte, and Applicants' alleged admissions.

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Amended independent claim 7 is reproduced below for the Examiner's convenience:

7. A method of maintaining data in a storage system, comprising the steps of:
maintaining a root inode and inodes for a file system in the storage system, the root inode pointing directly or indirectly to the inodes, and each inode storing file data, pointing to one or more blocks in the storage system that store file data, or pointing to other inodes, with different levels of indirection possible for the inodes to point to the blocks; and
maintaining an inode map and a block map for the file;
wherein when said inodes are maintained in the storage system, each inode only points to blocks in the storage system having a same level of indirection as other blocks pointed to by that inode.

The applied art, alone or in combination, is not seen by Applicants to disclose or to suggest the foregoing features of claim 7, at least with respect to the new feature that "when said inodes [capable of different levels of indirection] are maintained in the storage system, each inode only points to blocks in the storage system having a same level of indirection as other blocks pointed to by that inode." As noted in the application as originally filed at page 14, lines 18 to 21, one of the advantages of this feature is that it facilitates recursive processing of files. Of course, the claim is not limited to recursive processing.

Applicants have studied the applied art and have not seen any indication of limiting inodes capable of different levels of indirection in the manner claimed. Namely, Applicants have not seen any indication of limiting each of such inodes, when maintained in a storage system, to only point to blocks in the storage system having a same level of indirection as other blocks pointed to by that inode.

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For at least the foregoing reasons, reconsideration and withdrawal are respectfully requested of the § 103(a) rejection of claim 7 and its dependent claim 10 to 12, as is allowance of those claims.

Claims 17 and 20 to 22 recite memories storing instructions that implement the methods of claims 7 and 10 to 12. Likewise, claims 27 and 30 to 32 recite systems that implement the methods of claims 7 and 10 to 12, and claim 33 is a means-plus-function claim analogous to claim 7. Accordingly, reconsideration and withdrawal are respectfully requested of the § 103(a) rejection of those claims, as is their allowance.

Closing

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney can be reached at (614) 486-3585. All correspondence should continue to be directed to the address indicated below.

Respectfully submitted,

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Dated: August 20, 2003

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